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TO: Distribution

FROM: Eugene S. Burke

SUBJECT: August 10, 2004, Resource Allocation Review Board (RARB) Meeting Minutes

The following are the Minutes of the NASA/JPL Deep Space Network (DSN) Resource Allocation Review Board (RARB) Meeting held at JPL on August 10, 2004. The purpose of this Review is to address the oversubscription of the DSN 26/34/70-meter tracking assets. The Review Board consists of Project Managers, Project Scientists, and key JPL Interplanetary Network Directorate (IND) Deep Space Mission System (DSMS) Managers or their representatives. The Board is responsible for reviewing new or changed requirements, adopting recommendations to reduce periods of heavy contention, and for controlling changes to requirements. This Review addressed contention in 2005, 2006, and 2007.

Review Board Members

The following Review Board Members or their representatives were in attendance:

Bill Weber	JPL	Chairman
Gene Burke	JPL	Resource Allocation Planning & Scheduling Office Manager
Claudia Alexander	JPL	ROSETTA U.S. Project Manager
Albert Chang	JPL	Lunar-A and Hayabusa Project Representative
Bob Dutilley	GSFC	Space Science Mission Operations Project Representative
Bob Sodano	GSFC	(SOHO, WIND, Polar, Geotail, Cluster II, ACE, Image, MAP)
Jim Erickson	JPL	Mars Exploration Rover Project Manager
Bob Farquhar	APL	MESSENGER, New Horizons Project Representative
Nick Gautier	JPL	Kepler Project Scientist
Mark Garcia	JPL	Phoenix Project Representative
Chris Jacobs	JPL	Reference Frame Calibration Project Representative
Mike Klein	JPL	Radio Astronomy Project Manager
Chuck Klose	JPL	DSMS Engineering Program Office Representative
Robert Lock	JPL	Mars Reconnaissance Orbiter Project Scientist
Ed Massey	JPL	Ulysses/Voyager Project Manager
Bob Maze	JPL	Mars 2001 Odyssey Project Representative
Rich Miller	JPL	DSMS Plans & Commitments Office Manager
Bob Mitchell	JPL	Cassini Program Manager
Neil Mottinger	JPL	Muses-C Project Representative
Dan Ossing	APL	STEREO Project Representative
Steve Ostro	JPL	GSSR Project Scientist
Jeff Plaut	JPL	Mars 2001 Odyssey Mission Project Scientist
Bob Ryan	JPL	Stardust Project Representative
Chuck Scott	JPL	SIRTF Project Representative
Bob Shendock	GSFC	ST-5 Project Representative
Rance Skidmore	GSFC	GOES Project Representative
Martin Slade	JPL	GSSR Project Manager
David Spencer	JPL	Deep Impact Project Representative

Duvene Rivera	ITT	Deputy ITT JPL Program Manager
Tommy Thompson	JPL	Mars Express Orbiter U.S. Project Manager
Joe Wackley	JPL	DSMS Operations Office Program Manager
Brent Williams	SAO	Chandra Project Representative
Kathya Zamora	JPL	Dawn Project Representative

Review Materials
These Minutes include the material included in the bound handout book, as well as the presentations distributed at the RARB meeting:

Agenda

1. Introduction ..... B. Weber
2. Overview, Contention Summary ..... G. Burke
3. Action Items from August 2003 RARB ..... D. Morris
4. NASA Headquarters - Code S ..... B. Geldzahler
5. JPL DSMS Plans & Commitments Program Office (920) ..... G. Spradlin
6. JPL DSMS Engineering Program Office (940) ..... C. Klose
7. New Or Modified Project Requirements:
   - Dawn ..... M. Rayman
   - Kepler ..... T.Gautier
8. Resource Contentions
   - Analysis & Recommendations ..... N. Lacey
   - Projects Responses ..... Projects
   - Discussion / Decisions ..... All
9. New Action Items & Summary ..... G. Burke

Gene Burke introduced the members of the Review Board and thanked them for attending the review.

***Introduction* – *B. Weber*, RARB Chairman**

The Review Board and all the mission representatives were welcomed to the RARB. The group's successful handling of the Asset Contention Period (ACP), and the high activity surrounding the Cassini SOI and Messenger launch was acknowledged. A list of current missions being supported by the DSN and a list of potential future missions was presented.

Some aspects of a strategic plan in development, and some larger architectural decisions which are taking place in the Interplanetary Network Directorate (IND) were discussed. These changes will prepare the DSN for an expanding mission set In order for the DSN to move into the future and serve all the customers in a limited budget environment it is vital to know all critical events of a mission well in advance. It is important that TMS managers and project representatives get together early to clearly understand, predict and document the total system and operational implications of the mission. The term "best effort basis" will no longer be used. All such terms should be quantified well in advance to determine what the exact commitments are. Any extra tests, effort, and training needs should be stated well in advance because of the costs associated with every process.

Overview, Contention Summary* – *E. Burke

A brief introduction was given, stating the focus of the RARB is to review and resolve the different contention periods existing from July 2005 through the end of 2007. The RAPSO team has worked closely with the individual projects to clear most of the conflicts for this time period. Any remaining contentions that need to be solved outside the meeting will be assigned as an Action Item. All conflicts with Reference Frame Calibrations (RFC) and other less significant conflicts will be handled at the monthly JURAP meetings. A comparison of flight vs. non-flight requirements in 2006, and a brief overview of unsupportable time at each subnet was discussed. The meeting participants were asked to complete a customer survey and return it to David Morris.

August 2002 RARB Action Items Review* – *D. Morris

All Action Items from the February 04 RARB have been responded to and closed, and are included in the attached presentation material.

NASA Office of Space Science* – *B. Geldzahler

NASA appreciates the way the DSN is currently working. A vision for future DSN projects was presented, using an array of smaller antennas, optical communication, and the potential of quantum transportation. NASA is interested in flying Earth-science type missions around other planets. He stressed the importance of getting level-1 requirements from the missions. Projects and the DSN should consider themselves as equal partners not "customers". Organizational changes at NASA headquarters were discussed, and are included in the attached presentation material.

JPL DSMS Plan and Commitments Program Office* – *G. Spradlin

A brief discussion was given about the upcoming missions, their launch dates, DSN requirements, and their capabilities (see attached presentation material).

JPL DSMS Engineering Program Office* – *C.Klose

A brief overview was given on the upcoming downtimes, with an emphasis on tasks that will be completed in the year 2004 – 2005. The impact created by the downtimes and the benefits realized by the customers as a result of the improvements, were discussed (see attached presentation material).

Presentation: New or Modified Project Requirements

Dawn* – *M.Rayman

Dawn is the 9th discovery mission, whose objective is to examine the geophysical properties of the two most massive asteroids, Ceres and Vesta, to yield insights into the conditions and processes acting at the solar system's earliest epoch. The launch date is set for June 17, 2006. It is enabled by the use of Ion Propulsion System (IPS) which affords great flexibility in the mission design. It will use low-gain antenna during long thrust periods and high-gain antenna during coast periods. (See attached presentation material for details.)

Kepler* – *T.Gautier

The Kepler mission is set to launch in June 2007. It is the 10th discovery mission, and has a photometer as the single science instrument. It has the following science goals:

1. Determine frequency of terrestrial & larger planets in/near the habitable zones of a wide variety of stars
   a) Determine the distributions of sizes and orbital semi-major axes of these planets
2. Identify additional members of photometrically discovered systems with complementary techniques
3. Determine distributions of semi-major axis, albedo, size, and density of short-period giant planets
4. Estimate the frequency of planets in multiple-star systems
5. Determine the properties of those stars that harbor planetary systems.
   (See attached presentation material for details.)

Resource Contention Summary* – *N. Lacey

A brief overview was given regarding the Loading Study Initial Conditions, and the changes in Project requirements. Each month is evaluated for contentions for the years addressed at this Review. A description of critical events, an analysis of potential problems, and proposed recommendations are listed for each month. For background/source information view the *"Red Book"*(by clicking the following link: http://rapweb.jpl.nasa.gov/rarb-red.html).

Following are the results from the RARB negotiations, which will be used as the new baseline for DSN resource allocation:

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All recommendations made in years 2005 and 2007 have been agreed to. All recommendations for Reference Frame Calibrations (RFC) and Space Geodesy (SGP) from July 2005 through 2007 will be handled in mid-range scheduling and the unresolved conflicts would be handled in the monthly JURAP meetings. All recommendations from January through June 2006 have been agreed. In the months July through December 2006 all recommendations except the following have been agreed previously.

2006 Contention Period – July – Weeks 27 – 30

GSSR Mercury RSD GBT delete 3 of 5 supports in week 27, delete the 4-hour Mercury Radar support in week 28, and reduce Mercury RLC with Arecibo supports from 3 to 2 in week 28.

2006 Contention Period – August – Weeks 31 – 35

GSSR Mercury RSD with GBT move 2 of 6 supports from week 32 to week 31 and delete 4 supports in week 32. Move 1 of 4 Mercury RSD with Arecibo supports from week 35 to 36 and delete 3 supports in week 35. Delete Mercury Radar support in week 33 and move the support from week 34 to week 38.

M01O Mapping and MSPA with MGS delete two 8 hour passes per week at DSS-43, delete three of four 10-hour passes at DSS-14 in weeks 31, 32, 34 and 35 and one 10 hour pass at DSS-14,43 and at DSS-14 in week 33. Move 3 MSPA passes with MGS from DSS-14 to DSS-43 and reduce pass duration from 10 hours to 8 hours in week 33. Delete remaining 2 to 3 passes per week at the 34BWG2 subnet and MSPA four 8-hour passes per week with MEX Orbital Science at DSS-25,26,55.

MGS Mapping and MSPA with M01O delete two 8-hour passes per week at DSS-43, delete three of four 10-hour passes at DSS-14 in weeks 31, 32, 34 and 35 and one 10-hour pass at DSS-14,43 and at DSS-14 in week 33. Move 3 MSPA passes from DSS-14 to DSS-43 and reduce pass duration from 10 hours to 8 hours in week 33. Delete remaining 2 to 3 MSPA passes at the 34BWG2 subnet and MSPA three 8-hour passes per week with MEX Orbital Science at DSS-24,54.

2006 Contention Period – September – Weeks 36 – 39

M01O Delete 5 MSPA passes with MGS in week 37 and MSPA 5 passes with MRO aerobraking at DSS-14,43 in week 37 and reduce all pass duration from 10 hours to 8 hours at DSS-43 in weeks 36 – 39.

MEX Orbital Science MSPA all 4 passes at DSS-15,26 with MRO Prime Science at DSS-15,25,26,55,65 in week 37.

MGS MSPA the two 10-hour passes at 34HEF with MRO Prime Science and reduce pass duration from 10 hours to 8 hours at DSS-15,25,26,55,65 in weeks 38 and 39.

MRO Aerobraking MSPA 5 of 8 passes with M01O Mapping at DSS-14,43 in week 37. MSPA 2 of 14 Prime Science passes at 34HEF,34BWG2 with MGS Mapping in weeks 38 and 39. MSPA 4 passes at DSS-15,25,26,55,65 with MEX Orbital science.

2006 Contention Period – October – Weeks 40 – 43

M01O Mapping MSPA with MGS Mapping and Beta Supplement move 3 MSPA passes from DSS-26,55 to DSS-43. Move MSPA passes with MEX R/S from DSS-14,63 to DSS-63 only. Maximize MSPA capability wherever possible.

MGS Mapping and Beta Supplement MSPA with M01O Mapping move 3 MSPA passes from DSS-26,55 to DSS-43. Maximize MSPA capability wherever possible.

2006 Contention Period – December – Weeks 49 – 52

MRO agrees to the recommendation below as long as their uplink requirement is satisfied.
MRO Prime Science MSPA three 70M passes with M01O in week 49. MSPA WITH MGS Mapping 4 passes at DSS-25,24,26,34,54,55 in week 49 and 1 pass per week in weeks 51 and 52. Move 5 Prime Science DSS-25,24,26,34,54,55 to 2 at DSS-14 and 3 at DSS-43 in week 50, move 6 passes from DSS-25,24,26,34,54,55 to 70M in week 51 and move 4 passes from DSS-25,24,26,34,54,55 to 3 at DSS-43 and 1 at DSS-63 in week 52.

SOHO Keyhole move all passes from 70M/26M to 34HEF/26M in week. Additional support during the keyhole periods will be added on a best efforts basis at 70M/26M, 34H/26M and the 34BWG1 subnet in Mid-range Scheduling.

New Action Items

AI#	*Year*	*Month(s)*	*System*	*Responsible*	*Due Date*	*Status*
01	**2006**	**July-August**	**GSSR**	**M. Slade**	**09/16/2004**	**Open**

ACTION: Coordinate with Scientist representing Mercury Radar Speckle Displacement Co-observation with Green Bank Telescope or Arecibo Observatory on recommendations to minimize contention in these months.

AI#	*Year*	*Month(s)*	*System*	*Responsible*	*Due Date*	*Status*
02	**2006**	**August-September**	**Mars Missions**	**B. Mase K. Zamora**	**11/10/2004**	**Open**

ACTION: Coordinate MGS, Odyssey and MEX coverage during the MRO Aerobraking period.

AI#	*Year*	*Month(s)*	*System*	*Responsible*	*Due Date*	*Status*
03	**2006**	**December**	**SOHO**	**B. Dutilly**	**10/14/2004**	**Open**

ACTION: During Antenna Keyhole activities, the recommendation is to use 34m antennas versus 70m antennas due to oversubscription of the 70m subnet. 26m antenna usage was not in question.